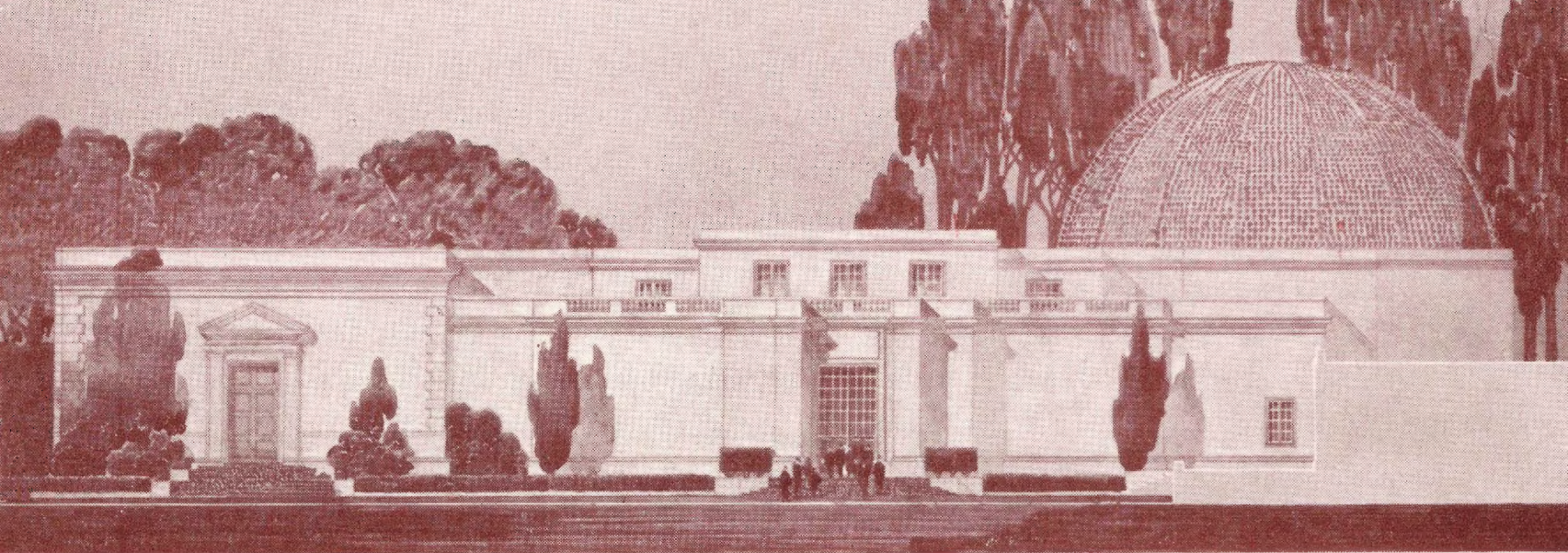




Architect's sketch of new Hall of Science and Morrison Planetarium

CALIFORNIA ACADEMY OF SCIENCES

Annual Report for the Year 1948

CALIFORNIA ACADEMY OF SCIENCES

GOLDEN GATE PARK

SAN FRANCISCO 18

BOARD OF TRUSTEES, 1948

J. W. MAILLIARD, JR., <i>President</i>	DANIEL E. KOSHLAND
CHARLES PAGE, <i>Vice-President</i>	NORMAN B. LIVERMORE
MISS LOUISE A. BOYD	T. S. PETERSEN
BRUCE CORNWALL	MRS. HENRY POTTER RUSSELL
EDWARD E. HILLS	BRAYTON WILBUR

THE PRESIDENT OF THE ACADEMY, *ex-officio*

THE TREASURER OF THE ACADEMY, *ex-officio*

J. F. LANDIS, *Secretary to the Board*

At the annual election held on February 18, 1948, the following officers were elected and served during the year:

M. E. LOMBARDI, *President*

PROFESSOR E. B. BABCOCK, *First Vice-President*

DR. GEORGE S. MYERS, *Second Vice-President*

DR. E. O. ESSIG, *Corresponding Secretary*

W. I. FOLLETT, *Recording Secretary*

FRANCIS P. FARQUHAR, *Treasurer*

The COUNCIL of the Academy consists of the above-mentioned officers with the addition of the Director, Dr. Robert C. Miller, and the Librarian, Dr. Charles H. Danforth.

REPORT OF THE PRESIDENT FOR THE YEAR, 1948

At the December, 1948, meeting of the Board of Trustees it was determined that sufficient funds were then available to justify calling for bids for the construction of the long-planned new Hall of Science and the Alexander F. Morrison Planetarium. Bids were received early in January and on January 26th, 1949, ground was broken.

Thus was brought to a successful conclusion the campaign inaugurated in April, 1947, the object of which was to provide funds for a planetarium as well as other important additions to the Academy's plant, which will include the Lovell White Memorial Hall of Man and Nature, the Morrison Auditorium, a substantial addition to the Simson African Hall and a Hall of Astronomy. In the basement of the new building our Junior Science Group will be housed in commodious quarters, and there will also be provided space for various laboratories and storage which has been so badly needed. It is noteworthy that the planetarium and Hall of Astronomy mark the entrance by the Academy into what is for it an entirely new field of science.

The completion of the structures themselves is expected by the end of 1949, and it is hoped that the auditorium will be available for use by that time, or shortly thereafter. It will, however, require some further months to install exhibits and to complete and install the planetarium projector.

This will be the first major addition to the Academy's plant since 1936 when the Simson African Hall was completed and opened.

It is evident, therefore, that the year 1948 may be considered not only a year of progress but one of great achievement, in that our building program was in that year assured of success. The actual construction work now going on is simply the second and final step in the program, impossible of accomplishment or indeed of initiation, except for the success of the vital first step, which happy circumstance I may say, was in great part due to the untiring efforts of the President of our Board of Trustees, Mr. J. Ward Mailliard, Jr.

In other ways also the year under review has been one of encouraging progress. There was renewed and expanded activity in field expeditions and in the ultimate result of field work—namely, scientific publications.

Activities in the field included an expedition to the region of the *Metasequoia* or Dawn Redwoods in China by a research associate of the Department of Entomology, jointly with Lingnan University of China, another to Northern and Western Africa for the same department, and numerous collecting trips nearer home which will be mentioned more in detail in the report of the Director.

Perhaps as fair a measure as any of the productivity and value of an institution such as ours is found in the number of publications in its scientific series released each year. From a low of only one such publication in 1947

(the result of restricted work in wartime and difficulties in printing immediately thereafter), the score rose in 1948 to 12 numbers of the Proceedings, totaling 441 pages. This is progress but our future output is likely to be restricted by the high cost of printing which has greatly increased in the past few years.

Our bimonthly magazine, *Pacific Discovery*, was launched early in the year. It was received with acclaim by our members and has progressed apace. As of December 31st, it had a paid subscription list of approximately 1,000 names exclusive of members who receive it at no extra cost. While this is an encouraging showing, it is evident that our subscription list must be greatly increased before this magazine is on a firm financial basis.

MEMBERSHIP:

As of December 31st, 1948, the Academy had 1490 members of all classes, an increase of 485, or 48 per cent, during the year. This compares with a decrease of 56 members during 1947. There was a decrease of 22 in Student Membership due to the same circumstances which caused a decrease the year before—namely, lack of adequate facilities. There was, however, a distinct improvement in regularity of attendance at clubroom and field meetings.

During the year, 49 life members were added to the rolls under the provision which bestows this classification after 25 years of regular membership or because of substantial gifts. Two persons were made life members because of valuable services to the Academy—namely, Mrs. H. P. Bracelin and Mr. Claude Hooke.

Thirteen persons were designated Patrons in recognition of important monetary gifts and two in recognition of valuable contributions to the Academy's activities and collections—namely, Mr. William Foster and Mrs. Ralph Hopping.

Patrons elected in 1948:

Mr. Dewey Donnell	Mrs. Ralph Hopping	Miss Johanna Volkmann
Mr. William Foster	Mr. George R. Keast	Mr. Ward G. Walkup
Mrs. A. Haas	Mrs. Norman B. Livermore	Miss E. Marion Warren
Mr. Walter S. Heller	Mr. W. P. Roth	Mr. George Whitney
Mr. I. W. Hellman	Mr. D. G. Volkmann	Mrs. Jennie B. Zellerbach

Four Honorary Members were elected at the annual meeting on February 18th, 1948. They were:

Professor LeRoy Abrams: Emeritus Professor of Botany at Stanford University.

Dr. William Beebe: Director, Department of Tropical Research, New York Zoological Society, and well known writer on Natural History.

Professor C. M. Yonge: Professor of Zoology, University of Glasgow.

Dr. William R. Maxon: Curator of Division of Plants, U. S. National Museum, Washington, D. C.

With regret I have to report the death of 27 members during 1948, among them that of Dr. William R. Maxon, elected an Honorary Member that year. Also Professor T. D. A. Cockerell, a Fellow since 1926; Professor William T. Shaw, a Fellow since 1945; Mr. M. Hall McAllister, a Patron since 1920; Mrs. J. D. Grant, a Patron since 1943; and Mr. Templeton Crocker, a Patron since 1931 and a Benefactor since 1932.

As of December 31st, 1948, the roll of the Academy's membership stood as follows:

Organizational Memberships	1
Institutional Memberships	2
Associate Members	11
Corresponding Members	9
Special Observers	19
Student Members	129
Patrons	56
Honorary Members	24
Fellows	99
Life Members	217
Regular Members	923
	1,490

The post-war revival of international science congresses continued at an accelerated pace during 1948 and the Academy was fortunate in being represented at several of the more important of these gatherings.

We were represented at the 13th International Congress of Zoology at Paris during July by Dr. Rolf Bolin, a Fellow of the Academy; at the International Congress of Entomology at Stockholm in August by Dr. Robert L. Usinger, a Research Associate in Entomology of the Academy; at the International Geological Congress at London in August and September by Dr. Robert Van Vleck Anderson, a Fellow of the Academy; and at the 11th Congreso Sud-Americano de Botanica at Tucuman, Argentina, in October by Mr. Lewis S. Rose, a Research Associate in Botany of the Academy.

The constitution requires the President at this time to report on the "progress, condition and needs" of the Academy. Progress which I have tried to outline above has been satisfactory. I think the condition of the Academy is sound both financially and organically. As for our needs, they are still great and not materially different from those mentioned in last year's report. It becomes increasingly evident that we need a modern structure in which to house our large and growing library; space for geological and mineralogical

exhibits and, as always, increased income for fields trips and research projects.

From its earliest beginnings the Academy has depended for financial aid on its members and friends in the community which it serves. Its buildings were built with funds voluntarily donated by individuals and private institutions. Practically all of its operating income, exclusive of that of the Steinhart Aquarium, is from private endowments.

In appealing to our members and friends for funds necessary for growth we are going directly to those whom the Academy serves and who appreciate its scientific value as well as its entertainment value. We hope that the direct appeal will continue to be successful.

Perhaps it is well that our needs are great and always with us since only by recognizing these needs and striving constantly to satisfy them do we bring all our efforts to bear toward a fuller and better realization of this Academy's high ideals.

Last year we aimed at the stars and next year we will have a planetarium. Let us continue to aim high.

M. E. L.



Miss Alice Eastwood receives from President Lombardi the gold medal presented to her by the Academy on her retirement after fifty-six years as Curator of Botany

REPORT OF THE DIRECTOR

FOR THE YEAR ENDING DECEMBER 31, 1948

One of the great problems of our day, as it has been of the civilizations of the past, is that of maintaining flexibility of mind in an adult population. William James once remarked that most people become old fogies at 25. Occasionally we see a person who is mentally young and vigorous at an advanced age, and such individuals are universally beloved and admired. They are, however, a small minority of the population. We rightly speak of them as exceptional people. We are fortunate to have one of them among us in the person of Alice Eastwood, Curator Emeritus of the Department of Botany, who has served as a member of the Academy's staff for fifty-seven years.

In most people intellectual hardening of the arteries sets in at an early date. Minds become static and ideas become fixed. There is resistance to change, and a tendency to talk of the "good old days." It has always been thus. The Scriptures admonish us: "Say not thou, What is the cause that the former days were better than these? for thou dost not enquire wisely concerning this."

What is the difference between a person who is mentally old and one who is ageless? It is primarily a matter of intellectual curiosity. A mind becomes fossilized when the learning process stops. Miss Eastwood is young at ninety because all her life she has been studying, learning, exploring, discovering. There is no time to linger on the past when one is finding out something new every day.

There is a lesson in this for all of us, a lesson for the community and for society. The way to prevent fixation of mind is to keep intellectual curiosity alive. In this the schools have a part to play, and the press, and — let us not forget — the museums. These last can, in truth, play a major role in stimulating the mind and promoting intellectual adventure. A museum that is filling its proper function will never be dull and fusty, but will be instead — as the word implies — a temple of the muses.

ATTENDANCE

The extent to which the California Academy of Sciences is fulfilling its public function is indicated by its growing membership and the increasing number of people entering its doors. The number of visitors in 1948 was as follows:

North American Hall	.	.	.	420,471
Simson African Hall	.	.	.	432,858
Steinhart Aquarium	.	.	.	1,074,608
				1,927,937

This represents an overall increase of 150,984 above the preceding year's figures.

The Aquarium was visited during the year by 485 public school, college and university classes or other organized groups, including 16,272 persons. The Museum (figures for North American and African Hall combined) was visited by 564 classes or other organized groups, including 21,780 persons. This is extremely gratifying, representing nearly a 100 per cent increase over the figures of the previous year. Student attendance is included in the total attendance given above.

MUSEUM AND AQUARIUM EXHIBITS

Of outstanding interest in new exhibits during the year was the Dawn Redwood exhibit provided by Dr. Ralph W. Chaney of the University of California. This included fossil specimens of *Metasequoia* from North America, where the tree has long been extinct, together with recent specimens obtained by Dr. Chaney on his dramatic expedition to "the Valley of the Tiger" in Central China. This had been considerably featured in the press, and naturally attracted much interest as a museum display.

Other new exhibits from distant points were a mounted Emperor Penguin from Antarctica and an immense specimen of the Alaska Brown Bear obtained through the courtesy of Mr. Belmore Browne, Mr. Norman B. Livermore, and the American Museum of Natural History.

With the assistance of Mr. William B. Pitts, three new exhibits have been installed in his fine mineral display: a case of agatized wood from Arizona, a series of polished spheres cut from gem stones, and a display of crystals. Dr. William Barclay Stephens has assisted in placing on display a fine series of watches from his collection, illustrating the story of the evolution of the watch.

The changing exhibit of wild flowers in the foyer of North American Hall continues to be a great popular attraction. Temporary exhibits utilized during the year were two series of paintings of flowers of Mallorca, and five series of photographs — bird photographs by Don Bleitz of Hollywood and nature photographs by Cliff Rattenburg of Marin County.

The Department of Exhibits has devoted much time to planning, with the Academy's architects, exhibits for the new building now under construction.

The Steinhart Aquarium celebrated its twenty-fifth anniversary on September 29, 1948. The importance of the Aquarium as an educational attraction and the popular esteem in which it continues to be held are attested by the fact that, in the first quarter-century of its existence, it was visited by 22,130,000 persons.

STUDENT SECTION

The Student Section of the Academy, under the direction of Miss Joanne Taylor and Mrs. R. E. Fink, has enjoyed a year of unprecedented activity.

Inasmuch as the Student clubroom is already being used to capacity, no effort has been made to increase the enrollment in this section.

The summer program consisted of two all-day field trips a week, with three days a week for work in the clubroom. The practice of careful field note taking was innovated. During the school year Saturday programs were emphasized. A series entitled "Expedition of Discovery" provided the imaginative excitement of exploration in the study of plant and animal life. Another series emphasized the life histories of common mammals found in the favorite hiking areas of our student group. At suitable low tides, trips were made to Moss Beach to give the students an introduction to the excitement of seashore collecting and the study of marine life.



Student Members of the Academy get an introduction to seashore biology at Moss Beach

The students of high school age made their way through a serious course in Invertebrate Zoology. Group trips were also made to the University of California, Western Regional Laboratories, etc., for the purpose of acquainting the students with career possibilities in science, and the prerequisites in various fields.

One of the Academy's outstanding needs is an endowment to enable it to maintain and to expand this important program for acquainting youth with the world of nature and the joy of discovery.

PUBLIC LECTURES

The following public lectures were given under the auspices of the Academy during 1948, those marked with an asterisk being lectures supported by the Dr. Walter B. Scaife Foundation:

JANUARY	20	MR. ROGER TORY PETERSON, National Audubon Society: THE RIDDLE OF MIGRATION*
MARCH	4	TOM AND ARLENE HADLEY, National Audubon Society: HAPPY VALLEY*
APRIL	12	DR. TELFORD H. WORK, National Audubon Society: BITS OF LAND ALONG THE COAST*
MAY	26	DR. RALPH W. CHANEY, University of California: ANCES- TRAL REDWOODS OF CHINA
JUNE	16	DR. ROBERT T. ORR, California Academy of Sciences: WINGED MAMMALS OF THE NIGHT
JULY	21	MR. JOSEPH R. SLEVIN, California Academy of Sciences: THE AUSTRALIAN BUSH
AUGUST	25	MR. JOHN THOMAS HOWELL, California Academy of Sci- ences: PLANT HUNTING IN THE NAVAJO COUNTRY
SEPTEMBER	22	MR. CECIL TOSE, California Academy of Sciences: INTO THE CANADIAN ROCKIES FOR MOOSE
OCTOBER	6	MR. KARL H. MASLOWSKI, National Audubon Society: SAGUAROLAND*
NOVEMBER	24	MR. WILLIAM FERGUSON, National Audubon Society: THIS CURIOUS WORLD IN NATURE*
DECEMBER	15	DR. EARL S. HERALD, California Academy of Sciences: FISH- ING IN THE PHILIPPINES — ANCIENT AND MODERN

STAFF CHANGES

On January 15, 1948, Dr. J. L. Kask left the Academy to take up his new duties as Chief Biologist of the Fisheries Division of the United Nations Food and Agriculture Organization. His position as Curator of Aquatic Biology was filled by the appointment of Dr. Earl S. Herald, who, by reason of prior commitments, did not take up his duties here until August.

On February 17 Mr. Walter Schneebeil began work as Aquarium Attendant.

Mr. Woodbridge Williams was appointed to the post of Junior Aquatic Biologist, replacing Mr. William B. Richardson, resigned. Mr. Williams started his duties March 1.

In May the Department of Ornithology and Mammalogy lost the services of Miss Grace Irene Crowe, who resigned to become Mrs. J. Gordon Irving.

Mrs. Birgitta Boeckel resigned from the library staff in May to make a journey to Europe. Her place was taken by Miss Nancy Dunwoody, who began work December 1.

On October 1 Miss Elizabeth McClintock was appointed a Research Assistant in the Department of Botany.

Mr. Thomas C. Groody was employed November 1 to carry on research on the behavior and physiology of the sardine, under a contract with the State of California.

Mr. Ignatius McGuire resigned his post as Assistant in Bibliography in the Academy Library on November 30 to take a position with the Federal Government.

The Academy's staff as of December 31, 1948, numbered forty-seven full time and twenty-three part time employees, in addition to fifteen persons holding honorary appointments.

FIELD WORK

Field collecting naturally constitutes one of the important activities of a natural history museum. Some fifty field trips were made during the year by members of the Academy's staff. A number of these partook of the character of expeditions, requiring extensive travel and weeks or months in the field.

In February, 1948, Mr. Joseph R. Slevin, Curator of the Department of Herpetology, returned from a six months' trip to Australia, during which he supplemented his previous collecting on that continent and visited many new localities. He brought back 2,102 additional specimens to be added to the Academy's collection of Australian reptiles and amphibians.

Mr. Borys Malkin, Research Associate in Entomology, was sent to Africa in the fall of 1948 and will continue field collecting there through a good part of 1949. He started his collecting in North Africa, and has subsequently worked into Nigeria and the Cameroons.

Dr. J. Linsley Gressitt of Lingnan University, also a Research Associate in Entomology of the California Academy of Sciences, led a party of five collectors into the recently explored Dawn Redwood region of Central China. The main purpose of this expedition was to obtain specimens of the insect associates of *Metasequoia* and its accompanying flora. An estimated 200,000 specimens were secured.

In November and December, Dr. Edward S. Ross, Curator of the Department of Entomology, Mrs. Ross, and Mr. Hugh B. Leech, Assistant Curator, made an overland trip into Mexico, collecting particularly in the states of



Dr. J. Linsley Gressitt, Research Associate in Entomology, California Academy of Sciences, and member of the faculty in Lingnan University, leader of the exposition to the Dawn Redwood region.

Other members of the exposition, left to right, Mr. Fu Ka-sui, Mr. Djou Yu-wen, both of Lingnan University and field helpers.



Nayarit, Colima, Oaxaca, and Vera Cruz. In addition to considerable general collections, important research collections were secured of Embioptera, the aquatic Coleoptera, and ants.

The major field expedition of the Department of Birds and Mammals was made by the Curator, Dr. Robert T. Orr, in the summer of 1948, to the Bitterroot Mountains of northeastern Idaho, continuing work begun in the Clearwater Mountains of Idaho in 1941. Shorter trips were made to Kern, San Luis Obispo, and Monterey counties in connection with a study of the life history of the Pallid Bat.

Field work of the Department of Botany included trips by Mr. J. T. Howell to northeastern Arizona and southeastern Utah, the headwaters of the Kings River in Fresno County, California, San Luis Obispo County (with Dr. T. H. Kearney, Research Associate), and the Mojave Desert (with Mr. Lewis S. Rose, Research Associate, and Dr. Carl Skottsberg of Gothenberg, Sweden).

The Department of Ichthyology established some kind of record with twenty-seven field trips by the Acting Curator, Dr. W. I. Follett, whose activities added 3,828 specimens of fishes to the Academy's collections.

ACCESSIONS

The Department of Botany accessioned 5,910 specimens during 1948, of which 1,094 were collected by the staff, 2,339 were received by exchange, and 2,477 were received by gift from the following collectors: Dr. R. C. Barneby, Dr. W. I. Follett, Dr. R. F. Hoover, Dr. T. H. Kearney, Mr. H. M. Pollard, Mr. Dwight Ripley, Mr. Lewis S. Rose, Dr. C. Skottsberg, Mr. B. C. Tharp, and Miss Elizabeth McClintock. This brings the total number of mounted specimens in the herbarium to 346,000.

The Department of Entomology received a total of 144,629 mounted and labeled specimens, which together with a larger number of specimens collected in the field and not yet mounted, brings the year's total to more than 350,000 specimens. Undoubtedly the most outstanding accession is the Dudley Moulton collection of Thrips which, world-wide in scope, numbers some 25,000 slides and includes many holotypes. Another addition of major importance is the Ralph Hopping Collection of Coleoptera, donated by Mrs. Hopping. This collection comprises more than 97,000 specimens, of outstanding value for forest entomology. Six thousand mounted insects, mostly from northern Arizona, were presented by Mr. R. P. Allen. Other important collections were donated by Dr. E. C. Van Dyke, Mr. J. L. Slevin, Mr. Bernard Brookman, Mr. R. W. L. Potts, Dr. William Hovanitz, Mr. George Mansfield, and Mr. Anatole S. Loukashkin.

An important series of fishes, including some of the rarest California forms, was contributed to the Department of Ichthyology by Dr. Carl L. Hubbs of the University of California. Mr. A. S. Coggeshall, Director of the Santa Barbara Museum of Natural History, generously contributed the

first specimen of the frillshark, *Chlamydoselachus anguineus* Garman, ever recorded from North American waters. An adult specimen of the ragfish, *Icosteus aenigmaticus* Lockington, which had appeared in shallow water near the Santa Cruz pier, was captured and donated to the Academy by Mr. Renaldo Ratto and Mr. Herbert F. Reusch. The event occasioned wide comment in the press. A total of 6,619 specimens was accessioned by the department during the year.

The Department of Herpetology accessioned 2,588 specimens in 1948, bringing the departmental collection to just over 75,000 reptiles and amphibians. The outstanding donation of the year was that of Mr. John Gasparetti, who made a gift of 306 reptiles and amphibians from Arabia.

Mr. Gasparetti also contributed 29 specimens of birds and mammals and two sets of birds' eggs from Saudi Arabia to the Department of Ornithology and Mammalogy. Accessions of this department numbered 296 during the year. The total holdings of the department now number 62,000 birds and 10,000 mammals.

The Department of Paleontology received from the Union Oil Company a large collection of Mesozoic fossils from Alaska. This collection, together with those obtained in the same region in 1937-38, will constitute an important working collection of fossils from that area.

Several smaller collections were received during the year, as follows: Pliocene fossils from San Mateo County by Eldridge Drew; Miocene and Pliocene fossils from Santa Barbara County and adjacent regions collected by geologists of the Tidewater Associated Oil Company; Tertiary fossils from the Olympic Mountains, Washington, by Professor F. C. McMillan of the College of Puget Sound; non-marine tertiary fossils from Fossil Hill, Churchill County, Nevada, by A. G. Smith; Mesozoic fossils from Germany by Mr. W. Haedler; a fine series of *Olivella biplicata* from the coasts of Oregon and California by E. W. Gifford.

Mr. F. L. Rogers continued to build up the department's excellent collection of Cirripedia. The total number of accessions for the year number 105 specimens, bringing the holdings of the department to 1,650,000 catalogued specimens.

The Academy's library has enjoyed an unusually large growth during 1948, the total accessions numbering 16,983. Nearly half of these were acquired by gift, the remainder through purchase and exchange. Dr. Earl G. Linsley presented his library of works on astronomy and meteorology. Dr. Stephens and Mr. Pitts added to the numerous periodicals which they present annually. From Miss Christine M. Donohoe we received 162 old garden magazines. Miss Eastwood purchased for us 400 orchid pamphlets from the Library of the Massachusetts Horticulture Society. From Sweden, Dr. Carl Skottsberg sent us a rare book entitled, "Fregatten Eugenie Resa Omkring Jorden aren 1851-53." It contains several colored lithographs of San Fran-

cisco at that time. Mr. Lawrence W. Saylor presented 2,212 entomological and miscellaneous pamphlets. From Mr. Claude Hooke we received a portfolio of 6 beautiful colored lithographs made by H. S. Crocker Co. from Elliott's Monograph of the Phasanidae.

Three six-foot banks of steel map cases were installed in the library during the year to accommodate 50,000 maps supplied by the Federal government, the Academy being an official depository of the Army Map Service.

While the growth of the library is extremely gratifying, each new acquisition adds to the problems of a department that has long since outgrown its quarters. One of the Academy's most pressing needs is a library structure to house this invaluable collection of books, maps and archives in a manner commensurate with their importance to the institution and the wide community it serves. Here is an unparalleled opportunity for public-spirited philanthropy to accomplish great and permanent good.

SHOP ACTIVITIES

Personnel specifically employed for work in the shop were A. S. Getten, Raymond Greeby and Frances Greeby, under the direction of Dr. G. Dallas Hanna. The first half of the year was devoted largely to the usual activities of such an establishment. Sixty storage cabinets for birds and mammals were made, and 20 cases for storing collections of insects.

A large high-vacuum coating machine was made for Tinsley Laboratories in Berkeley, especially for use in coating the mirrors used in the interferometers of the wind tunnels at Ames Aeronautical Laboratories, Moffett Field, California. The Academy's shop did this coating work up to the time of completion of the unit, and also made numerous special pieces of equipment for the same laboratories. Numerous other coating jobs were done for various institutions, especially for the Department of Engineering, University of California.

In an establishment as large and complex as the Academy, scarcely a day goes by that one or more essential tasks does not require attention, tasks which a shop such as ours is especially fitted to perform. The work may vary all the way from such simple things as fixing a typewriter or a clock to the making of a special label printing machine for the Department of Ichthyology.

On July 1 notice was received that work might proceed on the design and construction of the projector and accessory instrument equipment for the new planetarium. Therefore, the usual activities of the shop force were gradually eliminated and at the end of the year practically complete time was devoted to this new undertaking. Preliminary work consisted first in determining from the astronomical standpoint just what a projector would be required to do. This necessitated a study which fell largely to Mr. Getten. Dr. Russell W. Porter had been engaged in a consulting capacity earlier and his sugges-

tions proved very helpful. Detailed mathematical information which pertained to the specific astronomical problems involved was supplied by Professor Leon Salanave of Sacramento State College.

After clarification of the motions involved in such an instrument, the next step was to determine the most feasible mechanical means of securing them. This necessitated considerable experiment. It also seemed desirable to be able to check certain optical features at actual projection distance and for this purpose a 20-degree section of the dome, full scale, was set up.

Many of the details regarding the solar system assemblies had been worked out by the end of the year and construction of parts had begun. The magnitude of the task may best be appreciated by a recent estimate that the completed instrument will contain over 10,000 machined parts.

REPORT OF THE TREASURER

FOR THE FISCAL YEAR ENDED JUNE 30, 1948,
AND THE SIX MONTHS ENDED DECEMBER 31, 1948

The funds of the Academy have been substantially increased during the past eighteen months through generous donations for the purpose of constructing the Alexander F. Morrison Planetarium in Golden Gate Park adjacent to the Academy's other buildings. The contribution of \$200,000 from the Estate of May T. Morrison was more than matched by public subscriptions, so that on December 31, 1948, approximately \$500,000 had been received and at least \$100,000 additional was assured. Balances available for the entire building project, when augmented by assured pledges, will exceed \$1,000,000.

On the following pages there are set forth the condition of the respective funds of the Academy as at December 31, 1948, and a summary of the changes that have taken place in these funds since June 30, 1947. The accounts of the Academy are kept on the basis of a fiscal year ending June 30, but in order to present a more up-to-date statement, they have been extended in this report for an additional period of six months to December 31, 1948. Round figures are used for convenience.

FRANCIS P. FARQUHAR, *Treasurer.*

GENERAL OPERATING FUND

INCOME, EXPENSES, AND TRANSFERS

INCOME

	<i>Year ended June 30, 1948</i>	<i>Six months ended Dec. 31, 1948</i>
Net income from Commercial		
Building	\$124,700	\$97,000
Membership dues	4,300	1,200
Miscellaneous	7,400	200
	<u>\$136,400</u>	<u>\$ 98,400</u>

EXPENSES

Museum and departmental		
operations	\$110,400	\$54,500
Publication of "Pacific Discovery"		
(net)	12,400	6,500
Trustees' expenses	12,600	5,200
	<u>\$135,400</u>	<u>\$ 66,200</u>
Excess of income over expenses.....	\$ 1,000	\$ 32,200
Balance of fund at beginning of period ..	\$140,600	\$138,100
	<u>\$141,600</u>	<u>\$170,300</u>

TRANSFERS between funds

Museum Fund		
Equipment purchased	(\$3,500)	
Reimbursement in part		\$ 800
Endowment Funds		
To restore depreciation reserve for		
prior years		(\$77,500)
	<u>(\$ 3,500)</u>	<u>(\$ 76,700)</u>
Balance of fund at end of period	<u>\$138,100</u>	<u>\$ 93,600</u>

FUND BALANCE SHEET

AS AT DECEMBER 31, 1948

<i>Funds</i>	<i>Total</i>	<i>Cash Items</i>	<i>Stocks and Bonds</i>	<i>Miscel- laneous</i>	<i>Fixed Property</i>
General Operating	\$ 93,600	\$ 65,400		\$28,200	
Special Purpose	29,700	5,600	24,100		
Endowment	857,700	107,500			750,200
Ignatz Steinhart Trust	310,700	9,500			301,200
Museum	852,900				852,900
New Construction	968,600	486,300	482,300		
Total	<u>\$3,113,200</u>	<u>\$674,300</u>	<u>\$506,400</u>	<u>\$28,200</u>	<u>\$1,904,300</u>

CHANGES IN FUNDS – JUNE 30, 1947, TO DECEMBER 31, 1948

	Balance June 30, 1947	Year ended June 30, 1948		Balance June 30, 1948	Six months ended Dec. 31, 1948		Balance Dec. 31, 1948
		Increase	Decrease		Increase	Decrease	
General Operating Fund	\$ 140,600	\$ 1,000	\$3,500	\$ 138,100	\$ 33,000	\$ 77,500	\$ 93,600
Special Purpose Funds							
W. B. Scaife Lecture	\$ 10,100	\$ 500	\$ 500	\$ 10,100	\$ 200		\$ 10,300
Alvord Botanical	5,400			5,400	100		5,500
J. D. Grant	10,400	200		10,600			10,600
Other	2,900	400		3,300			3,300
	<u>\$ 28,800</u>	<u>\$ 1,100</u>	<u>\$ 500</u>	<u>\$ 29,400</u>	<u>\$ 300</u>		<u>\$ 29,700</u>
Endowment Funds							
James Lick	\$ 804,900			\$ 804,900			\$ 804,900
Charles Crocker	20,000			20,000			20,000
John W. Hendrie	32,800			32,800			32,800
	<u>\$ 857,700</u>			<u>\$ 857,700</u>			<u>\$ 857,700</u>
Ignatz Steinhart Trust							
Aquarium	\$ 310,600	\$ 100		\$ 310,700			\$ 310,700
Museum Fund							
North American Hall	\$ 88,500			\$ 88,500			\$ 88,500
Simson African Hall	174,000			174,000			174,000
Collections	296,100			296,100			296,100
Furniture and equipment	21,400			21,400	8,000		29,400
Library and publications	227,700	\$ 2,700		230,400			230,400
New construction in process	4,300	800		5,100	29,400		34,500
	<u>\$ 812,000</u>	<u>\$ 3,500</u>		<u>\$ 815,500</u>	<u>\$ 37,400</u>		<u>\$ 852,900</u>
New Construction Funds							
Alexander F. Morrison Planetarium..	\$ 57,500	\$225,000	\$4,200	\$ 278,300	\$211,200	\$ 21,800	\$ 467,700
Alexander F. Morrison Auditorium..	177,300	3,200		180,500	1,800	1,500	180,800
Leslie Simson African Hall.....	275,400	3,000		278,400	1,100	7,400	272,100
Ida M. Carmany Terrarium.....	5,100	100		5,200			5,200
James Moffitt Memorial	27,800	300		28,100			28,100
Alice Eastwood Herbarium	12,500	300		12,800	700		13,500
Memorial Fountain	1,200			1,200			1,200
	<u>\$ 556,800</u>	<u>\$231,900</u>	<u>\$4,200</u>	<u>\$ 784,500</u>	<u>\$214,800</u>	<u>\$ 30,700</u>	<u>\$ 968,600</u>
Total Funds	<u>\$2,706,500</u>	<u>\$237,600</u>	<u>\$8,200</u>	<u>\$2,935,900</u>	<u>\$285,500</u>	<u>\$108,200</u>	<u>\$3,113,200</u>

CALIFORNIA ACADEMY OF SCIENCES

MUSEUM AND AQUARIUM PERSONNEL*

ADMINISTRATIVE

ROBERT C. MILLER, *Director*
G. DALLAS HANNA, *Administrative Assistant*
VASHTI F. HAWLEY, *Secretary to the Director*

CLERICAL

HAZEL BLYLER	ADELE J. DOSS
WINIFRED BOOKER	GEORGIA FITZSIMMONS
VIDA BROOKE	VICTORIA GRIFFEN
CATHERINE CAMPBELL	RUTH HAWKINS
EVELYN DEASY	BULA WRISLEY

EDITORIAL

DON G. KELLEY EDWARD S. KESSEL

DEPARTMENT OF AQUATIC BIOLOGY

EARL S. HERALD, *Curator*
ROBERT P. DEMPSTER, *Aquatic Biologist*
FRANK KLEPPER, *Assistant Aquatic Biologist*

DEPARTMENT OF BOTANY

ALICE EASTWOOD, *Curator Emeritus*
JOHN T. HOWELL, *Curator*
ELIZABETH MCCLINTOCK, *Assistant Curator*
OLGA A. PADGETT, *Assistant*
ELIZABETH M. VINCENT, *Assistant*

DEPARTMENT OF ENTOMOLOGY

EDWARD S. ROSS, *Curator*
HUGH B. LEECH, *Assistant Curator*
EDWARD L. KESSEL, *Research Assistant*

* March 31, 1949

DEPARTMENT OF EXHIBITS

CECIL TOSE, *Preparator*
TOSHIO ASAEDA, *Assistant Preparator*
VELMA HARRIS, *Assistant Preparator*
RAYMOND SMITH, *General Assistant*

DEPARTMENT OF HERPETOLOGY

JOSEPH R. SLEVIN, *Curator*

DEPARTMENT OF ICHTHYOLOGY

W. I. FOLLETT, *Curator*
LILLIAN DEMPSTER, *Assistant*

LIBRARY

VERONICA J. SEXTON, *Executive Librarian*
NANCY C. DUNWOODY, *Assistant*
MINERVA HIRST, *Assistant*
KENNETH F. INNES, JR., *Assistant*

DEPARTMENT OF ORNITHOLOGY AND MAMMALOLOGY

ROBERT T. ORR, *Curator*
MARY L. PERRY, *Assistant*

DEPARTMENT OF PALEONTOLOGY

G. DALLAS HANNA, *Curator*
LEO G. HERTLEIN, *Assistant Curator*
MYRTLE KUHLMAYER, *Assistant*

HONORARY CURATORS

WILLIAM B. PITTS, *Gem Minerals*
WILLIAM BARCLAY STEPHENS, *Horology*
EDWIN C. VAN DYKE, *Entomology*
M. VONSEN, *Mineralogy*

RESEARCH ASSOCIATES

C. C. CHURCH, *Paleontology*
E. O. ESSIG, *Entomology*
G. F. FERRIS, *Entomology*
J. LINSLEY GRESSITT, *Entomology*
THOMAS C. GROODY, *Aquatic Biology*
E. S. GUEDET, *Entomology*
THOMAS H. KEARNEY, *Botany*
EARLE G. LINSLEY, *Astronomy*
E. GORTON LINSLEY, *Entomology*
ANATOLE S. LOUKASHKIN, *Ornithology and Mammalogy*
BORYS MALKIN, *Entomology*
LEWIS S. ROSE, *Botany*
LAWRENCE W. SAYLOR, *Entomology*
ALLYN G. SMITH, *Paleontology*
A. M. STRONG, *Paleontology*
R. L. USINGER, *Entomology*

JUNIOR SCIENCE GROUP

JOANNE TAYLOR, *Supervisor*
LOIS FINK, *Associate Supervisor*

SHOP

G. DALLAS HANNA, *Superintendent*
A. S. GETTEN, *Instrument Designer*
RAYMOND GREEBY, *Instrument Maker*
FRANCES GREEBY, *Assistant in Optics*
A. C. GUNDRED, *Instrument Maker*
HERBERT JOW, *Draftsman*

MAINTENANCE AND OPERATING

JOHN M. BARCLAY	GEORGE KOLTUNOVSKY
BENJAMIN T. CULLETON	JOHN MCKENNA
JOHN DOBSON	ARTHUR J. NOONAN
ARNOLD GSCHWEND	LOUIS PETE, JR.
FREDERICK W. HERMS	DONALD A. SIMPSON
JOHN R. HOOPER	WILLIAM W. SCHNEEBELI
RAYMOND L. JONES	NICHOLAS UDALOFF
RACHEL WORTHERLY	

